EXHIBIT 7

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

CELLULAR EVOLUTION LLC,	§	
	§	
Plaintiff,	§	
	§	**Case No. 2:19-cv-00232-JRG**
v.	§	***(Lead Case)***
	§	
T-MOBILE US, INC. and T-MOBILE USA, INC.,	§	**Jury Trial Requested**
	§	
	§	
Defendants.	§	

CELLULAR EVOLUTION LLC,	§	
	§	
Plaintiff,	§	
	§	**Case No. 2:19-cv-00228-JRG**
v.	§	***(Consolidated Case)***
	§	
AT&T MOBILITY LLC AND CRICKET WIRELESS LLC,	§	**Jury Trial Requested**
	§	
	§	
Defendants.	§	

DECLARATION OF DR. ANTHONY ACAMPORA REGARDING CLAIM CONSTRUCTION

I. INTRODUCTION

1. My name is Anthony Acampora. I have been retained by counsel for Defendants AT&T Mobility LLC, Cricket Wireless LLC, T-Mobile US, Inc., and T-Mobile USA, Inc. as an expert in this litigation to provide opinions concerning certain technical information and understanding of a person of ordinary skill in the art that may be relevant to interpretation of certain claim terms in U.S. Patent Nos. 6,741,868; 7,110,788; 7,203,514; 7,505,783; and 8,285,325 (collectively, the "Asserted Patents").

2. My opinions are based on my review of the intrinsic record of the Asserted Patents, the documents cited in this Declaration, all extrinsic evidence cited by the parties in their P.R. 4-2 disclosures, and my experience as detailed in this Declaration and my CV.

3. I am being compensated at a rate of $725 per hour for time spent on this matter. I am also being reimbursed for expenses that I incur during the course of this work. My compensation is not contingent upon the results of my study, the substance of my testimony, or the outcome of this litigation.

II. BACKGROUND AND QUALIFICATIONS

4. I received my Bachelor of Science, Master of Science, and Doctor of Philosophy degrees, all in Electrical Engineering, from the Polytechnic Institute of Brooklyn in 1968, 1970, and 1973, respectively. Both my Masters thesis and my Ph.D. dissertation involved theoretical aspects of electromagnetic wave propagation in plasma and gaseous media. From June 1968 through September 1988, I was employed at AT&T Bell Laboratories in various engineering, research, and managerial positions, all in the general area of telecommunications.

5. My initial work at Bell Laboratories (1968-1974) involved high power radar design and development, and signal design and processing for extraction of pertinent information from radar target returns, both focused on anti-ballistic missile defense applications. A modern radar

system operates by transmitting carefully designed radio signals toward a target, and processing the reflected radio signals arriving back at the radar, to determine target location, velocity, and key features. For ballistic missile defense applications, it is also important to distinguish real warheads from decoys.

6. My next assignment at Bell Laboratories (1974-1981) was in the Radio Research Laboratory, an organization responsible for basic research, where I was involved in new discovery and proposals involving novel approaches for communication satellite systems. Communication satellites are radio systems, often world-wide in scope, intended to enable wireless communications among terrestrial users from a platform of one or more Earth-orbiting satellites. My contributions to the communication satellite state-of-the-art included (1) strategies to efficiently encode and recover digital information sent to and from the satellites via high capacity radio beams; (2) novel systems and on-board satellite switching approaches that use multiple radio beams (so-called spot beams), each focused on a small portion of Earth, to vastly increase the capacity of a communication satellite by enabling the radio spectrum to be re-used among the spot beams; (3) strategies to acquire and maintain synchronization of radio signals sent to and from a satellite; and (4) a novel approach to overcome the effects of rain-induced attenuation of the radio beams that dynamically assigns available radio resources to those spots on Earth where rain attenuation is instantaneously most severe.

7. I was promoted to Supervisor of the Data Theory Group at Bell Laboratories in 1981, with responsibility for exploratory development of local area data networks. These are packet-switching networks intended to enable very high speed computer, voice, and video communications via on-demand capture of a shared transmission channel. Several new approaches were suggested and studied.

8. In 1984, I was promoted to Head of the Network Systems Research Department (one of several departments within the Radio Research Laboratory, later to become the Communications Systems Research Laboratory, at Bell Laboratories) with responsibility for new architectures for packet switching and multiwavelength optical networks, wireless networks for broadband local access, and integrated voice/data wireless networks. Contributions included (1) a system architecture for using a raster of focused radio beams to deliver broadband service to a large number of buildings from a central location within a city; (2) a novel packet switching architecture for Internet-like wide area packet networks; and (3) a wide area multimedia networking strategy to enable access to the enormous information-bearing capacity potential of optical fiber cabling.

9. I was promoted to Director of the Transmission Technology Laboratory in 1987, a group of approximately 80 people with broad charter for exploratory development of (1) transmission and switching systems for next-generation Internet-like packet-based networks and (2) applications for digital signal processing in telecommunications.

10. I left AT&T Bell Laboratories in September 1988 to become Professor of Electrical Engineering and Director of the Center for Telecommunications Research at Columbia University. Here, my responsibilities were three-fold: (1) education of students in the field of telecommunications, (2) pursuit of a program of independent research in the area of telecommunications, and (3) management of a National Science Foundation Engineering Research Center devoted to many aspects of telecommunications and founded for the express purpose of improving American economic competitiveness through research, education, and transfer of relevant technical findings from academia to the telecommunications industry. Research programs at the Center for Telecommunications Research were focused on multiwavelength fiber optical

networks, wireless communications, image and video communications, network management and control, and underlying photonic and electronic devices and materials. Contributions included (1) laboratory implementation and feasibility demonstration of the world's first multiwavelength packet switched optical network; (2) new approaches for randomly accessing a shared radio channel; (3) strategies for enabling rapid handoff among radio cells in a high capacity cellular network; (4) a rigorous understanding of multiwavelength optical network capabilities and limitations; and (5) algorithms for the efficient resource management and control of packet based multimedia networks.

11. In August 1995, I left Columbia University to become Professor of Electrical and Computer Engineering and Director of the Center for Wireless Communications at the University of California, San Diego (UCSD). Again, my responsibilities were threefold: (1) education of students in the field of wireless communications, (2) pursuit of a program of independent research in the area of wireless communications, and (3) management of an industrially funded research center devoted exclusively to wireless communications. Contributions included (1) strategies for allowing the use of so-called "smart" antennas in cellular-based packet radio networks; (2) a proposal for a new city-wide network based on a wireless mesh-based approach using either focused wireless beams of light or focused radio beams, intended to deliver broadband services to buildings and/or to connect wireless radio cells with the world-wide fiber-optic backbone network; and (3) mobility management strategies for high speed packet-based wireless networks. The second of these contributions has served as the technical foundation for at least two new venture-backed telecommunications equipment companies, one of which I co-founded.

12. In December 1999, I resigned as Director of the Center for Wireless Communications to pursue full-time research and education as a Professor of Electrical and

Computer Engineering at UCSD and on January 1, 2008, I became Professor of Electrical and Computer Engineering, Emeritus, Recalled to Research, maintaining an active research program and electively teaching an advanced graduate-level course on wireless networks.

13. At UCSD, I have taught courses on (1) probability, (2) random processes, and (3) wireless networks. My current research is focused on (1) broadband wireless networks for local access to homes, schools, and businesses; (2) wireless spaces to enable ubiquitous voice, data, and video wireless communications within buildings, and (3) so-called ad-hoc (self-organizing) networks of wireless sensor nodes for business and homeland security applications.

14. Over the course of my career, I have published (individually or with collaborators) over 170 original papers in scholarly journals and professional conference proceedings, and I am the named inventor or co-inventor on 40 U.S. patents.

15. I wrote one of the world's first textbooks devoted to broadband telecommunications, entitled An Introduction to Broadband Networks. I have lectured extensively on telecommunications in general and wireless communications in particular, and I have regularly attended, and continue to attend, numerous world-wide professional conferences. I have chaired several major telecommunications conferences, and I have chaired numerous professional conference technical sessions. I read the technical literature extensively, and subscribe to several leading journals in the field of telecommunications in general and wireless communications in particular. Over the years, I have delivered many 3 to 5 day intensive short courses on telecommunications and wireless communications to professional audiences of practicing engineers and others. In 1988, I was elected to the grade of Fellow of the Institute of Electrical and Electronics Engineers, cited for contributions to high capacity digital satellite systems and broadband local communication networks.

16. Additional details about my employment history, fields of expertise, courses taught, and publications are further included in my CV attached as Appendix A.

III. APPLICABLE LEGAL STANDARDS

17. I am not a lawyer or an expert in patent law. I have been informed by counsel of certain legal standards I understand to be relevant to claim construction. Within this declaration, I apply my understanding of those legal standards in describing how a person of ordinary skill in the art at the time of the asserted invention would have understood certain terms. The following is my understanding of those legal standards.

18. I understand that claim construction is for the Court to decide.

19. I understand that the patent claims are the numbered sentences at the end of each patent and define what a patent covers. The figures and text in the rest of the patent provide a description and/or examples of the prior art and/or the invention and provide a context for the claims, but it is the claims that define the breadth of the patent's coverage. Each claim may cover more or less than another claim. Therefore, what a patent covers depends, in turn, on what each of its claims covers.

20. I understand that the words of a claim are generally given the ordinary and customary meaning that the word would have to a person of ordinary skill in the art at the time of invention, read in the context of the patent. Because a claim is interpreted according to its meaning to a person of ordinary skill in the art reading the patent, the knowledge, education, and experience of that person are also relevant to determining the scope and meaning of a patent claim.

21. I understand that, in construing claim terms, courts look first to the intrinsic evidence of record, which includes the patent itself (including the claims and specification) and the prosecution history. I also understand that Courts may consider extrinsic evidence, such as expert and inventor testimony, dictionaries, and learned treatises, as long as they do not contradict

the intrinsic record. I understand courts should consider the intrinsic record first.

22. I understand that intrinsic evidence includes the prosecution history of a patent. The prosecution history of a patent provides the record of the examination of a patent application before the U.S. Patent and Trademark Office (PTO). The prosecution history provides evidence of how the patent examiner and the inventor understood the patent application and the claims, and can therefore be instructive on how to interpret the claims. It is my understanding that arguments or amendments made concerning one patent application can be instructive as to the meaning of like terms in another related patent application.

23. I understand that particular embodiments appearing in the written description should not be used to limit claim language that has broader effect. I understand that even where a patent describes only a single embodiment, claims are not to be read restrictively unless the patentee has demonstrated a clear intention to disavow or limit the claim scope. I understand that such disavowal must be clear, but does not need to be explicit. For example, I understand that such disavowal or limitation may be inferred, for example, from the specification distinguishing the invention over the prior art or describing the features of "the present invention" as a whole.

24. I understand that a person of ordinary skill in the art is deemed to read a given claim term not only in the context of the particular claim in which it appears, but also in the context of the entire patent, including the specification, the other claims, and the prosecution history.

25. I understand that differences among claims can be a useful guide in understanding the meaning of particular claim terms. For example, I am familiar with the doctrine of "claim differentiation" where the presence of a dependent claim that adds a particular limitation to an independent claim gives rise to a presumption that the limitation in question is not present in the independent claim. However, I understand that the doctrine of claim differentiation is not a hard

and fast rule and will be overcome by a contrary construction dictated by the written description or prosecution history. I also understand that the doctrine of claim differentiation is less relevant when comparing language from different independent claims because it is not unusual that separate claims may define the invention using different terminology. It is also my understanding that language in a claim should not be construed so as to render claim language superfluous.

IV. LEVEL OF ORDINARY SKILL IN THE ART

26. I understand that claim interpretation is from the perspective of a person of ordinary skill in the art at the time of the alleged invention.

27. The Asserted Patents claim priority to three Korean Patent Applications: (i) KR1999-31448 filed July 30, 1999, (ii) KR1999-31591 filed July 31, 1999, and (iii) KR1999-34344 filed August 19, 1999. I understand that Cellular Evolution has asserted that the claims of the Asserted Patents are entitled to a priority date of August 19, 1999. I do not opine in this declaration as to the correct priority date. In relation to issues of claim interpretation of the Asserted Patents, I do not believe there is any difference in the knowledge of a person of ordinary skill in the art ("POSITA") between July 30, 1999 and May 4, 2000, when the first U.S. patent application for the Asserted Patents was filed. Accordingly, my opinions presented in this declaration are the same regardless of whether the date of the invention is July 30, 1999, May 4, 2000, or any date in between.

28. In my opinion, a POSITA relevant to the Asserted Patents at the time of the asserted invention would have the equivalent of a four-year degree from an accredited institution (usually denoted as a B.S. degree) in computer science, computer engineering, electrical engineering, or the equivalent including exposure to cellular telecommunications systems. A person of ordinary skill in the art would also have approximately 3-4 years of professional experience with cellular telecommunications systems. Alternatively, a POSITA could have a Master's degree in any of the

same fields as above with exposure to cellular telecommunications systems. Such a person of ordinary skill in the art would also have approximately 2 years of professional experience with cellular telecommunications systems.

V. STATE OF THE ART

A. Overview of Cellular Systems

29. A cellular system includes mobile terminals, also known as mobile devices or User Equipment (UEs), and several elements of cellular infrastructure. As is shown in "prior art" Figures 1A and 1B of the Asserted Patents, those infrastructure elements are often divided into two groups: a first group of elements (shown as items 12 and 22, respectively in "prior art" Figures 1A and 1B) known as a radio network or radio access network, and a second group of components (shown as items 13 and 23, respectively in "prior art" Figures 1A and 1B) known as a core network. The core network attaches to other networks, such as a Public Switched Telephone Network (PSTN) or the Internet so that signals sent to/from mobile devices can originate/terminate anywhere. In other words, the cellular system radio access network (which the patent describes as the "radio network") and core network serve to provide mobile access to the world-wide telecommunications infrastructure.

1. Radio Networks and Radio Access Technologies

30. The first group of infrastructure elements referred to in the Asserted Patents as the "radio network," and also known as a "radio access network," may include elements from physical antennas to base stations to radio controllers. *See* 868 Pat. at 13:53-58 ("In the specification, a radio network means a network including a plurality of base transceiver stations (BTS) and at least a base station controller for controlling the plurality of BTSs in a synchronous or an asynchronous

mobile telecommunication system.").[1] Primary functions of the radio network include transmission and reception of radio signals over the air to and from the terminal, formatting and processing of messages, and management of over the air resources. To successfully communicate, the radio network and terminal utilize a known format for radio signals, messages, and related procedures over the air between the radio network and terminal, which are collectively known as a radio access technology. There have been numerous radio access technologies over the years. The Asserted Patents specifically address two prior art 3G code division multiple access (CDMA) radio access technologies.

31. First, in connection with "prior art" Figure 1A, the Asserted Patents discuss a "conventional synchronous mobile telecommunications system" using the prior art "CDMA-2000" radio access technology. 868 Pat. at 1:61-65; *see also id.* at 2:12-17 ("12 denotes a synchronous radio network (i.e., a code division multiple access-2000 (CDMA-2000) radio network) which performs a data interfacing operation with the synchronous terminal 11 and includes a synchronous base transceiver station/base station controller (BTS/BSC)."). CDMA-2000, also written as "cdma2000," is sometimes also referred to as "Multi-Carrier."

32. Second, in connection with "prior art" Figure 1B, the Asserted Patents discuss a "conventional asynchronous mobile telecommunications system" using the prior art "universal mobile telecommunication system (UMTS)" radio access technology. *Id.* at 1:66-2:2; *see also id.* at 2:32-35 ("22 denotes an asynchronous radio network (i.e., a UTRAN) which includes a base transceiver station (BTS) and a radio network controller (RNC)."). UMTS is sometimes also referred to as "W-CDMA," also written as "WCDMA," or "Direct Spread" ("DS").

[1] I note that the elements included in a radio network is a different issue and unrelated to whether the radio network is "hybrid type," as I discuss below.

33. While both CDMA-2000 and UMTS are based on CDMA technology, the physical signals used in these two radio access technologies differ in some respects. For example, neighboring base stations in a CDMA-2000 network all transmit a "pilot" channel based on the same "PN sequence," but distinguished by different time offsets in the sequence. To accomplish this time offset, the base stations must be time synchronized with each other. This time synchronization between base stations is consistent with the Asserted Patents' labeling of CDMA-2000 as a "synchronous" radio access technology. In contrast, neighboring UMTS base stations transmit different codes rather than offsets of the same code. This use of different codes, rather than time offsets, does not require that base stations be time synchronized with each other and is consistent with the Asserted Patents' labeling of UMTS as an "asynchronous" radio access technology.

2. Core Networks and Core Network Protocols

34. The second group of infrastructure elements, which may include elements such as a Mobile Switching Center (MSC) communicating with a Home Location Register (HLR), is known as the "core network." Primary services provided by the "core network" include "call control" and "mobility management." For example, "mobility management" enables the mobile terminal to register and receive cellular service from a mobile carrier as the terminal moves freely around the network, connecting to different base stations. To provide this service, various components within the core network communicate with each other, such as an MSC communicating with an HLR. Additionally, the core network exchanges information with the mobile terminal with the assistance of the radio network.

35. Just as with radio access technologies such as CDMA-2000 and UMTS, the structure of signals, messages, and procedures to transmit information to and from, and within, the core network is guided by a specified protocol. The Asserted Patents identify two prior art core

network protocols. First, in connection with "prior art" Figure 1A, the Asserted Patents reference the prior art ANSI-41 protocol, also known as IS-41. *Id.* at 2:20. The Asserted Patents describe a core network component operating in accordance with the ANSI-41 standard as a "synchronous" core network or a core network having a "synchronous" "operating type." *Id.* at 18:39-44. Second, in connection with "prior art" Figure 1B, the Asserted Patents reference the prior art GSM-MAP standard. *Id.* at 2:38. The Asserted Patents describe a core network component operating in accordance with the GSM-MAP protocol as an "asynchronous" core network or a core network having an "asynchronous" "operating type." *Id.* at 18:49-59.

36. As noted above, the services provided by the core network such as "mobility management" require the cooperation of both the radio network and the terminal. For example, in describing a "conventional" "prior art" CDMA-2000 system, the Asserted Patents explain that the CDMA-2000 radio network transmits over the air to the terminal a "conventional" "Sync channel message" that includes "information related to the synchronous [i.e., ANSI-41] core network 50." *Id.* at 3:49-57. This "prior art" "conventional" "Sync channel message" is shown in detail in Figure 7A and includes information such as "Network Identification," or "NID," that is defined by the ANSI-41 standard. Thus, in order to formulate a "prior art" "conventional" "Sync channel message," it was necessary for the CDMA-2000 radio network to interface with the ANSI-41 core network to obtain the information from the core network that the radio network would then include in the "prior art" "conventional" "Sync channel message" specified by the CDMA-2000 radio access technology standard and sent by the radio network.

37. The Asserted Patents further explain that "the synchronous [i.e., CDMA-2000] terminal 30 receives a Sync channel message from the synchronous [i.e., CDMA-2000] radio network 40 over a Sync channel and acquires information necessary to its connection to the

synchronous [i.e., ANSI-41] core network 50." *Id.* at 3:50-54. Again, in order to acquire information necessary to connect to the core network, it is necessary that the CDMA-2000 terminal understand and interface with the ANSI-41 core network.

38. The same is true of the "conventional" "prior art" UMTS system. The Asserted Patents explain that in this "conventional" system, a "conventional" "asynchronous terminal 60 receives a system information message from the UTRAN [UMTS radio network] 70 over a broadcast control channel (BCCH) and acquires information necessary to its connection to the asynchronous [i.e., GSM-MAP] core network 80." *Id.* at 5:65:6-3. Once again, it is necessary for the UMTS radio network (the exemplary asynchronous radio network of the Asserted Patent) to interface with the GSM-MAP core network to obtain information to place in the BCCH message. And, in order to acquire information necessary to connect to the core network, it is necessary that the UMTS terminal understand and interface with the GSM-MAP core network.

VI. "HYBRID" TERMINALS AND RADIO NETWORKS

A. The Operator Harmonization Group

39. As discussed above and shown in "prior art" Figures 1A and 1B of the Asserted Patents, a "conventional" CDMA-2000 radio network and terminal interfaced with an ANSI-41 core network. Likewise, a "conventional" UMTS radio network and terminal interfaced with a GSM-MAP core network. In June 1999, before the earliest potential priority date of the Asserted Patents, an organization known as the Operators Harmonization Group ("OHG") published an "Open Letter to Standard Organizations" proposing several initiatives to "harmonize" the separate CDMA-2000 and UMTS standards. CE_PA-00002399.

40. In one initiative, the OHG proposed a "modular" approach in which a "3G Operator may select one or more radio access modules together with one or more core network modules." *Id.* at 7. That is, OHG proposed that "ANSI 41 and GSM MAP based services should be fully

supported in the Radio Access Network associated with" both CDMA-2000 and UMTS. *Id.* at 8. The OHG open letter illustrates this concept in Figure 2 by showing a "flexible" system in which a single radio access technology mode can be matched with either ANSI-41 or GSM-MAP:

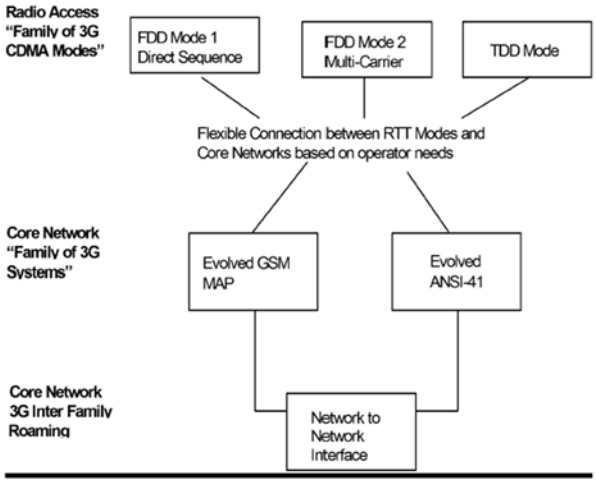


Figure 2: MODULAR 3G HARMONIZATION PROPOSAL

41. To accomplish this "flexible" "modular" approach, OHG proposed adding "hooks" and "extensions" to the existing CDMA-2000 and UMTS standards as shown in Figure 3 of the OHG open letter:

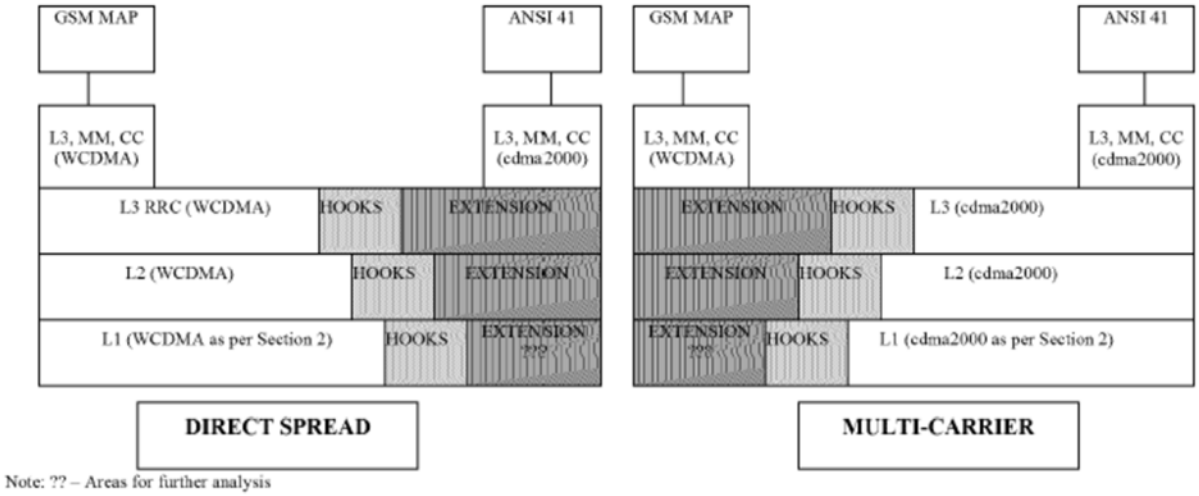
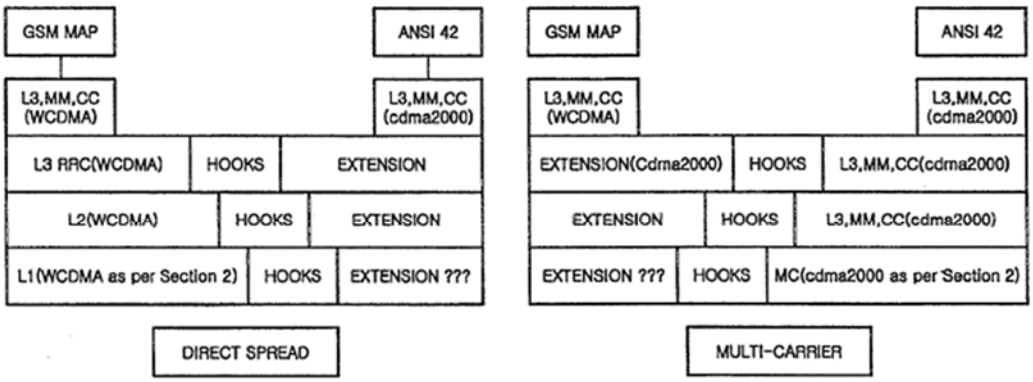


Figure 3: Protocol Structure for Implementing the Modular Concept

42. The white portions of Figure 3 of the OHG open letter represent the existing

functionality of the two 3G standards. Consistent with "prior art" Figure 1B of the Asserted Patents, the white portions of the left-hand side of Figure 3 of the OHG open letter show the existing support for interfacing with GSM-MAP within the "direct spread" "WCMDA" radio access technology (i.e., UMTS). Consistent with "prior art" Figure 1A of the Asserted Patents, the white portions of the right-hand side of Figure 3 of the OHG open letter show the existing support for interfacing with ANSI within the "multi-carrier" "cdma2000" radio access technology (i.e., CDMA-2000). Note that in each case, the radio access network and the terminals use the same radio access technology, e.g., CDMA-2000 (multicarrier) and W-CDMA (Direct Spread).

43. The Korean parent of the Asserted Patents, KR-1999-34344, includes a reproduction of Figure 3 of the OHG letter as Figure 3 of the Korean parent:



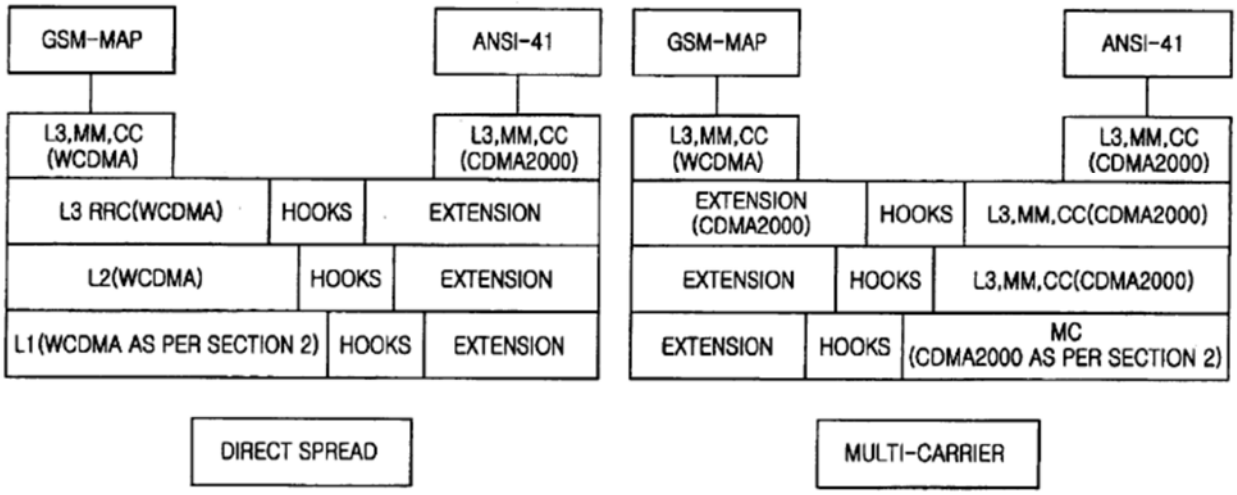
[도 3]

44. The Korean parent states:. "FIG. 3 is a view showing a protocol stack structure for interfacing with the core network according to a result of the OHG (Operator Harmonization Group) conference." CEL00009572 (English Translation of KR-1999-34344) at CEL00009594-95. The Korean parent further explains: "FIG. 4 shows core network interface architectures according to the result of the OHG conference." *Id.* at CEL00009595.

45. Figure 3 of the Asserted Patents is also substantially a reproduction of Figure 3 of the OHG open letter. While the Asserted Patents do not include the references to the OHG open

letter, the acknowledgments made in the Korean parent are still true. That is, it is apparent that Figure 3 of the Asserted Patents was taken from the OHG open letter and Figures 4A through 4D, which I discuss below, illustrate architectures "according to the result of the OHG conference."

FIG. 3



B. Description of "Hybrid Type" Terminals and Radio Networks in the Asserted Patents

46. The Asserted Patents use the term "hybrid type" to refer to terminals and radio networks that, as described in the OHG open letter, recognize and interface with core networks of both operating types (i.e., ANSI-41 and GSM-MAP) while operating in a single radio access technology. The Asserted Patents state that an "IMT-2000 system can have the following four interface architectures"

> first: synchronous [i.e., CDMA-2000] terminal--synchronous [i.e., CDMA-2000] radio network--synchronous ANSI-41 network,
>
> second: synchronous [i.e., CDMA-2000] terminal—synchronous [i.e., CDMA-2000] radio network--asynchronous GSM-MAP network,
>
> third: asynchronous [i.e., UMTS] terminal--asynchronous [i.e., UMTS] radio network--synchronous ANSI-41 network and

> fourth: asynchronous [i.e., UMTS] terminal--asynchronous [i.e., UMTS] radio network--asynchronous GSM-MAP network.

868 Pat. at 6:56-64. Note that for the first and second interface architectures, both the terminal and the radio network use CDMA-2000, while for the third and fourth interface architectures, both the terminal and radio network use UMTS.

47. In these four "interface architectures," the "first" architecture is the "conventional" architecture described in "prior art" Figure 1A. "Embodiment 1" of the Asserted Patents relates to a "hybrid type synchronous radio network" and "hybrid type synchronous terminal" as shown in Figures 4A and 4B that adaptively switch between the "conventional" "first" architecture and the "second" architecture that includes the same radio access technology as "conventional" Figure 1A, but where the synchronous [i.e., CDMA-2000] terminal and radio network must interface with a GSM-MAP, rather than ANSI-41, core network.

48. Likewise, the "fourth" architecture described above is the "conventional" architecture described in "prior art" Figure 1B. "Embodiment 2" of the Asserted Patents relates to a "hybrid type asynchronous radio network" and "hybrid type asynchronous terminal" as shown in Figures 4C and 4D that adaptively switch between the "conventional" "fourth" architecture and the "third" architecture that includes the same radio access technology as "conventional" Figure 1B, but where the asynchronous [i.e., UMTS] terminal and radio network must interface with an ANSI-41, rather than GSM-MAP, core network.

49. A POSITA at the time of the alleged invention would have understood that the Asserted Patents use the term "hybrid type" to refer to terminals and radio networks that recognize and interface with core networks of both operating types (i.e., ANSI-41 and GSM-MAP) while operating in a single radio access technology. This is consistent with usage throughout the Asserted Patents, including the Abstract of the 868 Patent:

> The ***hybrid type*** synchronous or asynchronous ***radio network determines the operating type of the core network*** when the core network has a connection thereto, and ***sends the determined core network operating type information*** and information related to the core network to the ***hybrid type*** synchronous or asynchronous ***terminal***, thereby allowing the synchronous or asynchronous terminal to ***smoothly perform a data interfacing operation with the core network***.

868 Pat. at Abstract (emphasis added); *see also id.* at 1:9-1:41.

50. Likewise, the Asserted Patents state:

> As described above, the method and the apparatus in accordance with the present invention ***adaptively sets a protocol and interfaces among the terminal, the base station and the core network on the basis of an operating type of the core network***.

Id. at 17:52-56 (emphasis added).

51. As another example, the Asserted Patents describe "each of the terminal and the radio network" having "a hybrid operating type" as "being possible to be set as either a synchronous operating type or an asynchronous operating type." *Id.* at 8:45-48. A POSITA at the time of the alleged invention would have understood that this description is consistent with the usage of "hybrid type" throughout the Asserted Patents.

52. The Asserted Patents consistently distinguish between "conventional" and "hybrid type" terminals and radio networks by explaining that "hybrid type" equipment improves upon "conventional" equipment by including the functionality discussed above. For example, the Asserted Patents state that "the conventional synchronous [i.e., CDMA-2000] terminal and radio network have. [sic] a disadvantage in that the synchronous [i.e., CDMA-2000] terminal ***cannot be interfaced with any other networks than a synchronous [i.e., ANSI-41] core network*** connected thereto because it cannot recognize core network operating type information." *Id.* at 7:59-64 (emphasis added). "Similarly, the conventional asynchronous [i.e., UMTS] terminal and radio network have a disadvantage in that the asynchronous [i.e., UMTS] terminal ***cannot be interfaced with any other networks than an asynchronous [i.e., GSM-MAP] core network*** because they

cannot recognize core network operating type information." *Id.* at 7:65-8:3 (emphasis added).

53. The fact that "hybrid type" equipment recognizes and interfaces with core networks of both operating types is also apparent by comparing "Conventional" "prior art" Figure 1B with Figure 4C. Both figures illustrate the same "fourth" architecture described above of an "asynchronous [i.e., UMTS] terminal--asynchronous [i.e., UMTS] radio network--asynchronous GSM-MAP network."

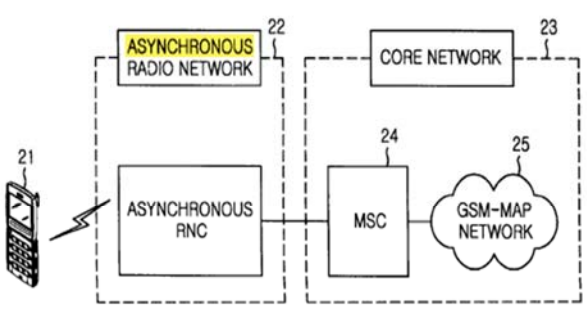


FIG. 1B
(PRIOR ART)

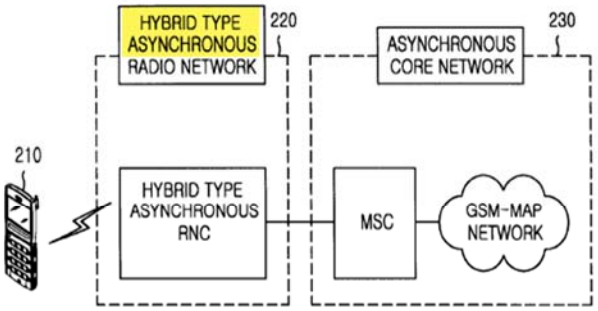


FIG. 4C

54. "Prior art" Figure 1B differs with Figure 4C only in that in Figure 4C "the reference numeral 210 denotes a hybrid type asynchronous terminal [and] 220 denotes a hybrid type UTRAN which is a hybrid type asynchronous radio network." *Id.* at 14:22-26. What makes the terminal and radio network in Figure 4C "hybrid type" is that those same devices are also present in Figure 4D recognizing and interfacing with an ANSI-41 core network.

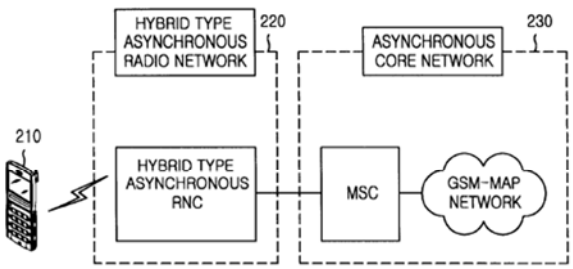


FIG. 4C

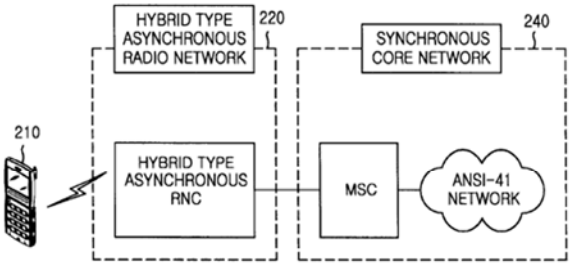


FIG. 4D

55. Note that in all cases, the radio network and the terminal operate with a single radio access technology: either synchronous CDMA-2000 for both the terminal and the radio network, or asynchronous W-CDMA for both the terminal and the radio network. What makes these components "hybrid" is not the ability to choose a particular radio access technology but, rather, the ability to selectively interoperate with a synchronous or asynchronous core network while operating in a single radio access technology. In this way, the term "hybrid type" is different from terms used in the prior art such as "dual mode" or "multi-mode." Prior to 3G, "dual mode" or "multi-mode" terminals had, for example, two modes for different radio access technologies, such as modes for IS-136 and for IS-95. In contrast, both the "hybrid type synchronous terminal" (such as a hybrid type CDMA-2000 terminal) ("Embodiment 1") and the "hybrid type asynchronous terminal" (such as a hybrid type UMTS terminal) ("Embodiment 2") of the Asserted Patents relate to the ability to selectively interoperate with a synchronous or asynchronous core network while operating in a single radio access technology (which is either a synchronous or asynchronous radio access technology). Thus, as discussed in further detail in Section VII.A below, as used in the Asserted Patent, the words "asynchronous" and "synchronous" refer to the type of core network, and separately and independently, the same words refer to the type of radio access technology. However, the use of the word "hybrid" is only used to describe the ability of the terminal and radio network to operate with either a synchronous or asynchronous core network protocol; a hybrid

terminal and a hybrid radio network both recognize a core network protocol and interface with this while operating in a single radio access technology. That is, what makes these components "hybrid" is not the ability to choose a particular radio access technology but, rather, the ability to selectively interoperate with a synchronous or asynchronous core network while operating in a single radio access technology.

56. The Asserted Patents do not disclose any terminal or radio network that switches between radio access technologies.

C. "Adaptively Set" Information and Equipment Operating Types

57. As discussed in Section VI.A, above, the OHG open letter describes the proposed modification of existing 3G standards to support both core network types as a "modular" and "flexible" system. Consistent with implementing the "flexible" "modular" architecture proposed in the OHG open letter, the Asserted Patents repeatedly emphasize the present invention as "adaptively setting a protocol and interfacing with the core network" in order to "smoothly" interface with core networks of either operating type: "the method or the apparatus for interfacing in ***accordance with the present invention adaptively sets a protocol on the basis of an operating type of the core network*** and ***smoothly interfaces*** among the terminal, the base station and the core network." *Id.* at 20:48-52; *see also id.* at 17:52-56.

58. A POSITA at the time of the alleged invention would have understood that to achieve the goals of the "present invention," information about the operating type of the core network and the protocol for interfacing with the core network must be "adaptively set" in both the radio network and terminal. That is, the "present invention" would not work without using at least a "hybrid type" terminal and "hybrid type" radio network as described above, along with

information about the operating type of the core network being adaptively set.[2]

59. For example, as discussed in Section V.A.2, above, the core network relies upon the radio network to include information about the core network in a broadcast message to terminals in the area. The radio network cannot perform this function without interfacing with the core network to obtain this information, which is different for GSM-MAP and ANSI-41. One feature of a "conventional" UMTS radio network is it cannot interface with an ANSI-41 core network. To "adaptively" and "smoothly" interface with core networks of different types as described in the "present invention," a POSITA at the time of the alleged invention would have understood that a radio network must at least be a "hybrid type" radio network as described above.

60. As another example, Asserted Patents state:

> As apparent from the above description, ***according to the present invention***, even though ***a hybrid type synchronous or asynchronous terminal*** is connected to either a GSM-MAP core network or an ANSI-41 core network, it ***can smoothly be interfaced with the connected core network because it is able to recognize the operating type of the connected core network*** and information related to the core network.

Id. at 23:33-39. Likewise, the Asserted Patents state:

> ***The present invention relates*** in general to a technique for interfacing among a mobile terminal, a base station (BS) and a core network in a next-generation mobile telecommunications system, and more particularly to a method, an apparatus and a computer readable record media storing instructions for executing the same method for interfacing among a hybrid type mobile terminal, a hybrid type base transceiver station/base station controller (BTS/BSC) and a core network in a next-generation telecommunication system, e.g., an international mobile telecommunications-2000 (IMT-2000) system and so on, in which ***a hybrid type synchronous or hybrid type asynchronous radio network determines an operating type of the core network when the core network has a connection thereto, and sends information about the determined core network operating type and information related to the core network to a hybrid type mobile terminal***.

[2] In this section I describe certain features that a POSITA would have understood were minimally necessary for the alleged invention to be operable. I do not suggest that these features would have been sufficient nor that the claims are enabled.

Id. at 1:9-25. These passages again show how the "present invention" would not work without using at least a "hybrid type" terminal and "hybrid type" radio network as described above, along with information about the operating type of the core network being adaptively set. That is, the Asserted Patents disclose that a hybrid terminal can adapt to interface with either core network type "because it is able to recognize the operating type of the connected core network" based on core network operating type information determined by and received from the hybrid radio network. *Id.* at 23:33-39. If the information about the core network operating type were not adaptively set, hybrid type radio networks and terminals could not adaptively and smoothly interface with core networks of different types as described in the "present invention."

61. As another example, the Asserted Patents state:

> ***In order to be operable adaptively to the above four interface architectures***, each of the ***hybrid type synchronous and asynchronous terminals*** in the next-generation mobile telecommunications system has ***both asynchronous CC and MM protocol entities serving for the GSM-MAP core network and synchronous CC and MM protocol entities serving for the ANSI-41 core network*** at the layer 3 in the protocol stack structure, which is a different from each of the conventional synchronous and asynchronous terminals.

Id. at 14:35-44. Here, the Asserted Patents confirm that a terminal must at least include and switch between protocols for interfacing with both ANSI-41 and GSM-MAP core networks "in order to be operable adaptively" in both an architecture including an ANSI-41 core network and a GSM-MAP core network. *Id.* Given the fact, as discussed above, that the terminal and radio network must operate with the same core network type, a radio network must likewise be operable with both an ANSI-41 core network and a GSM-MAP core network.

62. Finally, I understand that in briefing to the Court, Cellular Evolution stated:

> The Asserted Patents allow a hybrid terminal to seamlessly switch from a core network having one synchronization type to a core network having another synchronization type, thereby improving operational flexibility of a mobile terminal.

Dkt. No. 39 at 28. I agree that "seamlessly switching" between synchronous and asynchronous core networks is a feature of the hybrid-type terminal that would be required of the claimed invention, consistent with my analysis above.

D. Specific Claim Terms

63. For the reasons discussed throughout this Declaration, a POSITA at the time of the alleged invention would have understood, whether or not explicitly described as having "a hybrid operating type," that the claim term "terminal" means a "hybrid-type terminal" and "hybrid-type terminal" means: "a terminal that can adaptively set a protocol to seamlessly switch between interfacing with synchronous and asynchronous core networks to match received core network operating type information."

64. For the reasons discussed throughout this Declaration, a POSITA at the time of the alleged invention would have understood, whether or not explicitly described as having "a hybrid operating type," that the claim term "radio network" means: "hybrid-type radio network including a plurality of base transceiver stations (BTS) and at least a base station controller for controlling the plurality of BTSs in a synchronous or an asynchronous mobile telecommunication system" and "hybrid-type radio network" means: "a radio network that can adaptively set a protocol to seamlessly switch between interfacing with synchronous and asynchronous core networks to match the determined current core network operating type."

65. For the reasons discussed throughout this Declaration, a POSITA at the time of the alleged invention would have understood that the claim terms "core network operating type information" and "information element identifying an/the operating type of a/the core network" mean: "adaptively set information specifying the one or more operating type(s) of the connected core network."

VII. MULTIPLE CONTEXTS OF "ASYNCHRONOUS" AND "SYNCHRONOUS," AND USE OF "HYBRID"

66. As discussed in Section V.A, above, the Asserted Patents use the terms "asynchronous" and "synchronous" in at least three contexts. First, the Asserted Patents use the term to identify the radio access technology shared by the radio network and terminal. *See* Section V.A.1. In this context, "synchronous" refers to equipment operating using the CDMA-2000 radio access technology, while "asynchronous" refers to equipment operating using the UMTS radio access technology.

67. Second, the Asserted Patents use the terms, with or without the modifier "operating type," to refer to the protocol used by the core network. *See* Section V.A.2, above. In this context, "synchronous" refers to an ANSI-41 core network, while "asynchronous" refers to a GSM-MAP core network. *See id.*

68. Third, the Asserted Patents use the terms, with or without the modifier "type" or "operating type," to refer to the core network protocols that a terminal or radio network recognizes and interfaces with while operating in a single radio access technology. *See id.*

69. The Asserted Patents use the modifier "hybrid," with or without the modifier "type" or "operating type," to describe a terminal or radio network that recognizes and interfaces with core networks of both operating types (i.e., ANSI-41 and GSM-MAP) while operating in a single radio access technology. Thus, a POSITA at the time of the alleged invention would have understood the labels "hybrid," "hybrid type," or "hybrid operating type" as denoting these capabilities in a terminal or radio network.

70. A POSITA at the time of the alleged invention would have understood that "a hybrid type asynchronous terminal" and "a hybrid type UTRAN [i.e., UMTS radio network] which is a hybrid type asynchronous radio network" operate in accordance with the UMTS radio access

technology and recognize and interface with GSM-MAP and ANSI-41 core networks. Because "hybrid" is only used to describe the ability of the terminal and radio network to recognize and operate with each of a synchronous and asynchronous core network protocol while operating in a single radio access technology, a POSITA at the time of the alleged invention would have understood that the separate reference to "asynchronous" must therefore refer to the radio access technology used, i.e., UMTS.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 27th day of February, 2020 in New York, New York.

Anthony Acampora, Ph.D.